(12) UK Patent Application (19) GB (11) 2 335 959 (13) A

(43) Date of A Publication 06.10.1999

(21) Application No 9907046.8

(22) Date of Filing 29.03.1999

(30) Priority Data
(31) 9801414 (32) 31.03.1998 (33) MY

(51) INT CL[6]
F16L 33/22

(52) UK CL (Edition Q)
F2G G24B G24B7

(56) Documents Cited
US 5797633 A US 5622393 A US 5178423 A
US 4729583 A US 4400021 A US 4257629 A
US 4162092 A

(58) Field of Search
UK CL (Edition Q) F2G G10A G24B G24Z G4H
INT CL[6] F16L 33/00 33/10 33/22 37/10 37/48

(71) Applicant(s)
Wang Han Yap
845 Jalan Utama, Air Keroh Heights, 75450 Melaka, Malaysia

(72) Inventor(s)
Wang Han Yap

(74) Agent and/or Address for Service
Withers & Rogers
Goldings House, 2 Hays Lane, LONDON, SE1 2HW, United Kingdom

(54) Abstract Title
Hose coupling

(57) A method and apparatus for fastening a soil hose 1 to flow controlling devices or conduits 3 uses an internally threaded retainer nut 2. The inlet or outlet of the device or conduit 3 has a conical end 31 with an externally threaded portion 32 disposed at a distance from the inlet/outlet hole 33. The soft hose 1 is passed through the retainer nut 2 and its end 11 is attached to the conical end 31 before fastening the coupling by tightening the externally threaded portion 32 with the retainer nut 2. The retainer nut 2 preferably includes an annular flange (24, figures 2a,5) which engages with the exterior surface of the hose 1. The diameter of the opening at the inlet/outlet hole 33 may be altered to accommodate hoses of different sizes, by employing a washer (23, figure 5) of the required diameter, which is placed within the retainer nut 2 and retained behind the flange (24, figures 2a,5). The flow controlling device may be a valve of any type such as a tap, and the conduit may be a coupling means of a straight (figure 3), cross, T or Y configuration.

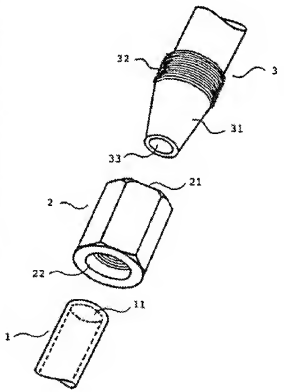

Figure (1)

GB 2 335 959 A

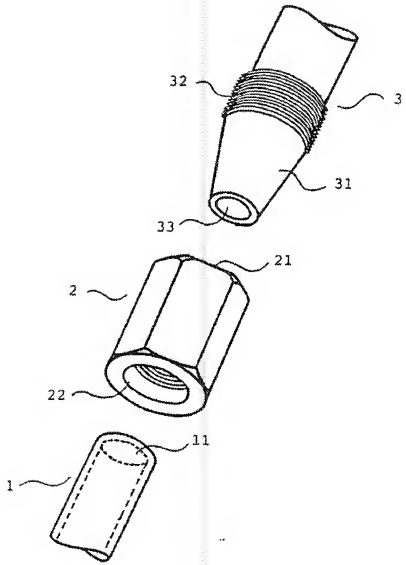

Figure (1)

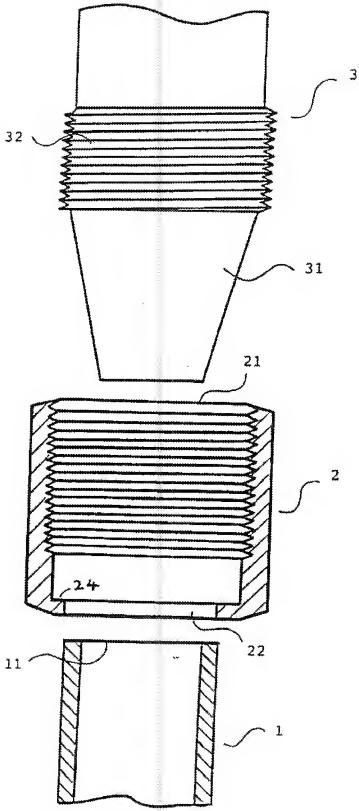

Figure (2a)

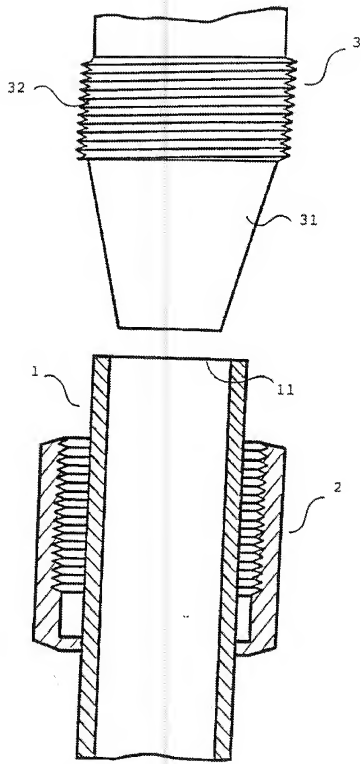

Figure (2b)

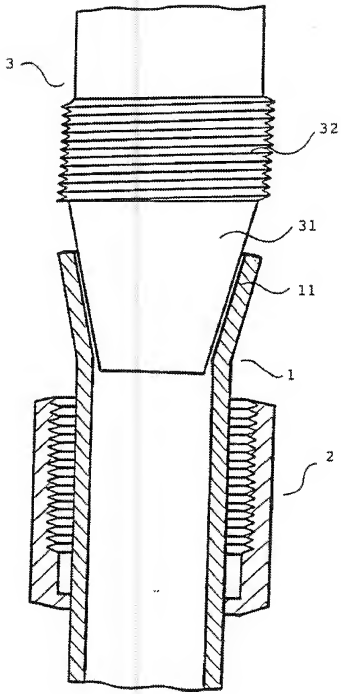

Figure (2c)

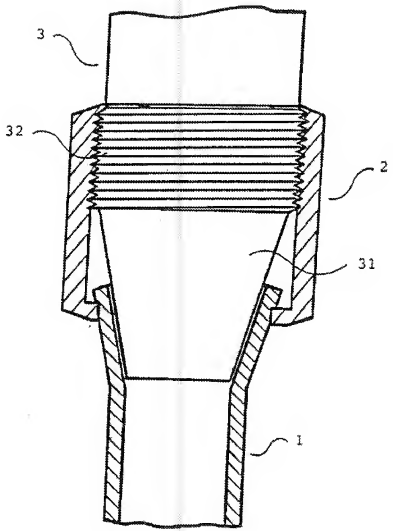

Figure (2d)

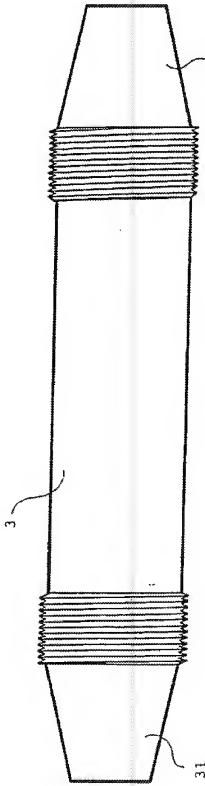

Figure (3)

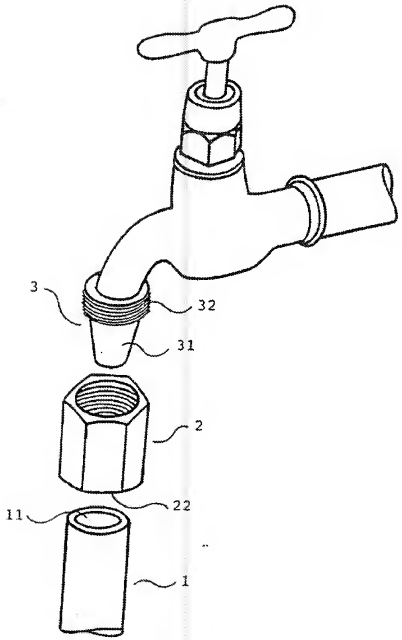

Figure (4)

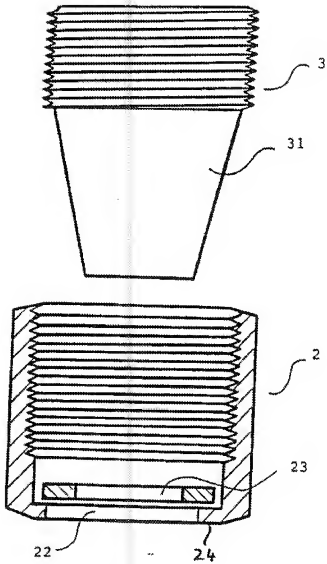

Figure (5)

A METHOD OF FASTENING A SOFT HOSE TO A HARD CONDUIT

The invention relates generally to a method for jointing fluid transport conduits or pipe sections. Particularly, it relates to a method of fastening a soft hose to a hard conduit.

Devices known as valves, cocks, taps, and faucets are used for controlling the flow of liquids and gases. "Valve" is a general term. The familiar water tap (or faucet) is technically a valve. The inlet or outlet end of a conduit is usually a straight pipe section. Where a soft hose is required to be connected, it is common to connect it directly to the inlet or outlet end of the conduit. In order to prevent back flow due to pressure build-up, a clipping means is employed to firmly attach the hose to the solid conduit. To tighten and unfasten the clipping means, a screw driver is also employed. Over time, the efficiency of the clipping means deteriorates. This prior art method is therefore cumbersome and not efficient.

It is a primary object of the present invention to teach an efficient method of fastening a soft hose to a solid conduit. This is achieved primarily by configuring the inlet or outlet end of a conduit in the shape of a conical section with an externally threaded portion further away from the hole, attaching the engaging end of a soft hose to the conical end, and tightening the externally threaded portion with a retainer nut.

It is another object of the invention to adapt to different sizes of soft hoses to be connected. This could be achieved by the provision of different retainer nuts with an opening of various sizes. Alternatively, this could be achieved by the provision of a special retainer nut with one large opening, and a washer element of various sizes.

It is also the object of the invention to apply the method of fastening to flow controlling devices including valves, cocks, taps, and faucets, and coupling means of a straight, cross, T, or Y configuration.

Figure 1 shows a perspective drawing of a first embodiment of the invention in the form of the three basic components: a soft hose, a retainer nut and a conduit with a conical end.

Figure 2a shows a view of the three components before assembly, the nut and the hose are shown in cross-section.

Figure 2b shows a cross-section view of the soft hose passing through the retainer nut, the conical end of the conduit is not shown in cross-section.

Figure 2c shows a cross-section view of the invention with the soft hose engaging the conical end of the conduit, the conical end is not shown in cross-section.

Figure 2d shows a cross-section view of the three components in assembled position, the conical end of the conduit is not shown in cross-section.

Figure 3 shows a second embodiment of the invention in the form of a straight coupling element with two conical ends.

Figure 4 shows a third embodiment of the invention in the form of a modified tap.

Figure 5 shows a cross-section view of the retainer nut employing a washer element to adapt to different sizes of a soft hose, the conical end of the conduit is not shown in cross-section.

Figure 1 shows a perspective drawing of a first embodiment of the invention in the form of three basic components: a soft hose (1), a retainer nut (2) and a conduit (3). The soft hose (1) is made of elastomer material, with or without re-enforcing elements. The conduit (3) and the retainer nut (2) are made of metallic materials including iron, steel or stainless steel; or non-metallic materials including plastic. One end (21) of the retainer nut (2) is open, with a diameter that matches that of the conduit (3). The other end of the retainer nut (2) is closed with an opening (22) which adapts to the soft hose (1) of various sizes to be connected. The inlet or outlet end of the conduit (3) is configured in the shape of a conical end (31) such that the diameter reduces gradually. Further away from the hole (33) of the conical end (31), there is provided integrally an externally threaded portion (32).

To facilitate explanation of the teachings of the invention, same reference numerals have been used to denote similar components. Figs. 2a and 2d show in sequence the various steps of attaching a soft hose (1) to a conduit (3). Firstly, the diameter of the soft hose (1) preferably must match that of the lower opening (22) of the retainer nut (2). The opening (22) is defined by an inwardly extending flange (24). After passing through the retainer nut (2), the engaging end (11) of the hose (1) is attached to the conical end (31) of the conduit (3). It is important to note that the engaging end (11) is expanded due to the elastic nature of the elastomer material. This provides a tightening action. Finally, when the retainer nut (2) engages the externally threaded portion (32), the flange (24) defining the opening (22) grips into the engaging end (11) of the hose (1). Thus, a sealing effect is achieved.

To those skilled in the art, various modifications and applications are possible within the scope of the teachings according to the invention. For an example, Figure 3 shows a second embodiment of the invention in the form of a straight coupling element, which is a special conduit (3) with two conical ends (31). Coupling means of a straight, cross, T, or Y configuration can be adapted to practise the invention. The invention can also be applied to flow control devices including valves, cocks, taps or faucets. Figure 4 shows a third embodiment of the invention in the form of a modified water tap.

Since soft hoses (1) of different sizes are used to connect to the conduit (3), one possibility of adapting to this situation is to provide retainer nuts (2) with openings (22) of different sizes. This means that the thickness of retainer nuts (2) also varies. Where a soft hose (1) of larger diameter is used, the engaging end (11) is attached near to the larger diameter of the conical end (31). Theoretically, the thickness of retainer nut (2) needed is smaller. Where a hose (1) of smaller diameter is used, the engaging end (11) is attached to the smaller diameter of the conical end (31). The thickness of the retainer nut (2) needed is larger.

Another possibility also exists to handle the above mentioned situation. According to the invention, a special thick retainer nut (2) with a large opening (22) can be used, without having to change to different retainer nuts (2). Instead, a washer element (23) is employed to adapt to different sizes of a soft hose (1). Figure 5 shows a cross-section view of the invention employing a washer element (23) placed inside the retainer nut (2) and retained behind the flange (24).

Claims

1. A method of fastening a soft hose to flow controlling devices, or conduits, with the assistance of an internally threaded retainer nut, comprising the steps of :-

   integrally configuring the inlet or outlet end of the device or conduit in the shape of a conical end;

   integrally providing an externally threaded portion further away from the hole of the conical end;

   passing the soft hose through the retainer nut and attaching the engaging end of the soft hose to the conical end;

   and then tightening the externally threaded portion with the retainer nut.

2. A method of fastening a soft hose to a flow controlling device or a conduit as in claim 1 in which the thickness of the retainer nut can vary and its closing end is disposed with an opening, depending on the size of the soft hose to be connected.

3. A method of fastening a soft hose as in claim 1, in which the internally threaded retainer nut is thick and its closing end is provided with a large opening, whereas the opening can be adapted to the sizes of different soft hoses by employing a washer element of different sizes placed inside the retainer nut.

4. A method of fastening a soft hose as in claim 1, 2 or 3, in which the engaging end of the soft hose, being made of elastomer material, constitutes a sealing means to the retainer nut.

5. A method of fastening a soft hose as in any preceding claim, in which the flow control device or conduit is solid and made of metallic materials including iron, steel and stainless steel, or non-metallic materials including plastic.

6. A method of fastening a soft hose to flow controlling devices or conduits substantially as described herewith with reference to the Figs. 1 to 2d, 3, 4 or 5.

7. A device for implementing the method of any preceding claim.

8. A device as claimed in claim 7 and which includes a valve, cock, tap and faucet, wherein the inlet or outlet end of its conduit is integrally configured to that of a conical end.

9. A device as claimed in claim 7 or claim 8, and which includes a coupling means of a straight, cross, T or Y configuration.

10. A joint comprising a flow controlling device or conduit having an inlet or outlet end which is conical, the flow controlling device or conduit further having an externally threaded portion further away from the inlet or outlet hole of the flow controlling device or conduit than the conical end, the joint further comprising a soft hose receiving at least part of the conical end, and the joint further comprising a retainer nut, which the soft hose passes through, the retainer nut being screwed onto the externally threaded portion of the flow controlling device or conduit to thereby clamp the soft hose between the retainer nut and the conical end.

11. A joint as in claim 10 in which the thickness of the retainer nut can vary and its closing end is disposed with an opening, the diameter of which depends on the size of the soft hose to be connected.

12. A joint as in claim 10, in which the internally threaded retainer nut is thick and its closing end is provided with a large opening, whereas the opening can be adapted to the sizes of different soft hoses by employing a washer element of different sizes placed inside the retainer nut.

13. A joint as in claim 10, 11 or 12, in which the engaging end of the soft hose, is made of elastomer material, so as to constitute a sealing means to the retainer nut.

14. A joint as in any of claims 10 to 13, in which the flow control device or conduit is made of metallic materials which may include iron, steel and stainless steel, or non-metallic materials which may include plastics.

15. A joint as in any of claims 10 to 14 which further includes a valve, cock, tap or faucet, wherein the inlet or outlet end of its conduit is integrally configured to that of a conical end.

16. A joint as in any of claims 10 to 15 which further includes a coupling means of a straight, cross, T or Y configuration.

17. A joint substantially as described herewith with reference to the Figs. 1 to 2d, 3, 4 or 5.

The Patent Office

INVESTOR IN PEOPLE

Application No:	GB 9907046.8	**Examiner:**	Dr Steve Chadwell
Claims searched:	1-6,10-17	**Date of search:**	27 July 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): F2G (G4H, G10A, G24B, G24Z)

Int Cl (Ed.6): F16L 33/00 33/10 33/22 37/10 37/48

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	US 5797633	(KATZER et al) see whole document	1,4,10,13
X	US 5622393	(ELBICH et al) see whole document, especially fig. 1, col. 5 ll. 20-26, col. 6 ll. 8-17	1,2,4,5,10, 11,13,14
X	US 5178423	(COMBEAU) see especially figs. 1-3, col. 1 ll. 12-19, col. 3 ll. 51-54	1,4,5,10, 13-16
X	US 4729583	(LALIKOS et al) see especially figs. 4 and 5	1,4,10,13
X	US 4400021	(DUFFIELD) see whole document	1,4,10,13
X	US 4257629	(MAPLE et al) see whole document, especially figs. 1-3, 7 and 8	1,2,4,5,10, 11,13,14
X	US 4162092	(HAYES) see whole document, especially all figs., col. 2 ll. 37-53, col. 4 ll. 37-55	1,3-5, 10,12-14

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.